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GENTES HERBARUM

Occasional Papers on the Kinds of Plants

By L. H. Bailey

Miscellaneous Fascicle

26. Certain noteworthy Brassicas
27. Novel Chrysanthemum species
28. Phaseolus lunatus and relatives
29. Neglected Jasminums
30. New genus in Sterculiaceæ
31. Two Pseuderanthemums, and notes on nomenclature

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199. CONTRAST IN LEAF AMBITUS between coles and common kitchen kales.—*Brassica oleracea* var. *Tronchuda* above (Gent. Herb. ii, fig. 110); *Brassica fimbriata* below, in its autumnal state.

ARTICLE 26. CERTAIN NOTEWORTHY BRASSICAS.

It has been the custom, particularly since the appearance of Augustin Pyramus DeCandolle's important paper on the cabbage tribes in Transactions of the Horticultural Society of London in 1824 (vol. v, 1-43) to arrange the cultivated cabbages and turnips and their kin under four species of Brassica: *B. oleracea*, *B. campestris*, *B. Napus*, *B. Rapa*. The fifth species discussed by DeCandolle, *B. præcox*, need not be considered in the present paper.

The four species of Brassica were established by Linnæus in 1753, and probably only *B. oleracea* was known in an original or indigenous state, although habitats were given. It has been the assumption that cabbages, kales, cauliflowers, brussels sprouts and some others have developed from the perennial *B. oleracea* of seacoasts in Europe. I have adopted this assumption. I have collected the species *B. oleracea* in native places and have grown it from the native seeds; yet I have not convinced myself of the accuracy of many of these suppositions.

The difficulty is that one cannot study these questions in the herbaria because of so few and so imperfect specimens in them; and those who have field experience with the plants are not likely to have taxonomic training or to note phylogenetic lines of development. Moreover, we are tied by tradition. We have possessed ourselves of the notion that we must not describe a plant as a new species if we do not know its nativity; this prevents us from studying plants of ancient domestication.

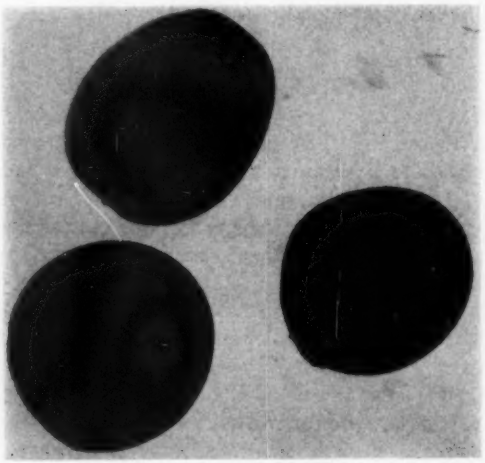
We deal here with cultigens. The words *cultigen* and *indigen* were proposed by me in 1918 (Science, n.s. xlvii, 306-308) to designate species of known and recognized occurrence in nature (indigens), and domesticated groups with equally good specific characters but of which origin and nativity are unknown. As example of an indigen I cited *Thuja occidentalis* and of a cultigen *Zea Mays*. My definition of the terms has been disregarded by many writers, and the word cultigen has been used as if synonymous with the concept of horticultural variety. Against this practice I protest. In my original article I wrote: "I am not thinking of mere variations, even if well marked, but of important groups or clans of known characteristics under domestication." My plea was for an orderly method of treating cultigens in taxonomy, but the method is not yet devised. My practice in this article is a further contribution to such an end.

It is easy and simple enough to say that garden kales are all *Brassica oleracea* var. *acephala*. In fact, it is too easy. If a person grows any number of kinds of kales they may still all be kales to him, and he may not take

notice. If he has numbers of herbarium sheets of them, however, complete with flowers and fruits and radical leaves, he may see at once that they fall into two very distinct groups: one set bearing much expanded basal leaves with rounded ends and a few small lobes at the base of the blade; the other set prevailingly with narrower mostly oblong leaves and the lobing apparent the whole length of the blade and extending deeply into it or even to be curled or fimbriate, with many leaflets or detached lobes along the petiole. These contrasts are well seen in Fig. 199. If he looks further he observes that the first set comprises also the true tree kales, and the second set the dwarf kales with many forms so cut and crisped as to be good subjects for ornament, although medium tall kinds may be amongst them.

There are other good differences that correlate with the foregoing characteristics. For example, late in 1936 Albina F. Musil, then Assistant Botanist of the Division of Seed Investigations, United States Department of Agriculture, challenged my inclusion of Dwarf Siberian kale within the complex of *Brassica oleracea*, basing the dissension on seed characters. I asked her for seeds of this and other Brassicas that I might review the case, and I have grown the interesting things she sent me as well as other kinds. The kale situation is now ready for report, and I have added conclusions on certain other cultivated Brassicas, although still other parts of the project await further study. This paper, then, is an extension of the studies presented in Gentes Herbarum in 1922 (not now available) and revised in 1930 (vol. ii, fasc. v).

Seeds of the coles and turnips appear to have been little taken into account in differentiating species of Brassicas, yet they now probably afford some of the best distinctions inasmuch as other parts of the plants are subject to great modification in the long course of cultivation. In my second Brassica paper, 1930, I contrasted seeds of a few of the species, and I now follow the same course in the present group although I do not declare that all the plants under discussion here have genetic kinship.



200. SEEDS OF KOHLRABI FOR COMPARISON.—*Brassica caulorapa* (×15).

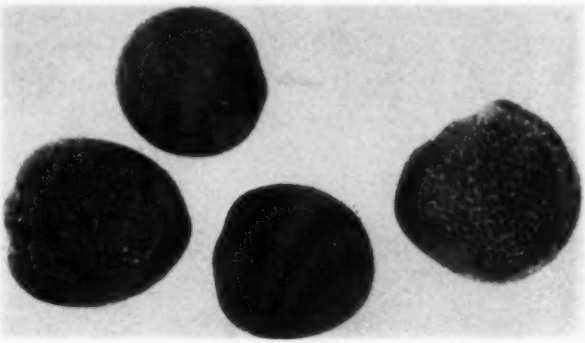
The seed analyst ar-

ranges Brassicas into groups that may not accord with the traditional taxonomic treatments; the analyst may be correct: I find corroborating evidence in the gross morphology. Seeds of Brassica have conduplicate cotyledons (folded together with radicle lying between them). The external marks of this position are often prominent on the seed surface, particularly in the Campestris and Rapa groups: the marks are the ridge over the radicle and the valley either side of it between the radicle and edges of the cotyledons. In the key that follows I propose a new arrangement of some of the most puzzling Brassicas, that heretofore have been lumped or disregarded. Only the plants apparently much modified by long cultivation are included, and this explains why *B. hirta* (*B. alba*). *B. kaber* (*B. arvensis*) and *B. carinata* are not in evidence. Reasons for elevating the binomials *B. hirta*, Moench, and *B. kaber*, Wheeler, over the familiar names *alba* and *arvensis* are explained by L. C. Wheeler in Rhodora, xl, 306-309 (1938).

In studying seed characters in Brassica one should have well chosen samples, free of admixture. Many distributed samples show much variation in size even if correct in name, depending on vigor of plants from which they came, whether the pods were all fully developed, and probably also whether seed breeding had been practiced in the stock. In making a key I have had in mind the best developed and completely ripe seeds in any authentic sample.

It has been the general tendency to refer unrecognized cultivated Brassicas to *B. campestris* and *B. Rapa*, since these species are familiar to Europeans and Americans; some of them, however, may be offshoots of east-Asian species. If we now separate them as independent species we may remove our prejudices and eventually approach the subject of origins more intelligently.

We like to hope that cytological and genetical studies may help us on the origins and definitions of the troublesome Brassicas, but the reader may see at once that records made on the usual or prevailing botanical names are of no value to



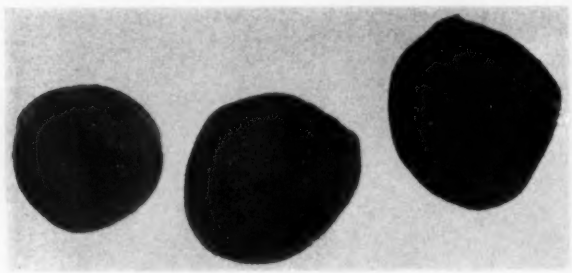
201. Seeds of dwarf Siberian kale.—*Brassica fimbriata* (×15)

these ends; and students in those fields must learn to discriminate and diagnose the plants in comparable terms, with preservation of specimens. (Note statement on p. 216, fasc. v, vol. ii, Gent. Herb.)

The reader may be reminded that seed studies in Brassica are not new or even recent. They were begun at least about seventy years ago. Much of the work cannot be followed connectedly through the maze of names. The present paper is naturally not a histological study but only an effort to employ gross seed characters in the taxonomic definition of classes and species. Perhaps it will suggest a hopeful line of observation when Brassicas are to be determined with a view to orderly nomenclature. In stating that seed-coats are featureless I have in mind the view one obtains from careful use of an approved hand-lens 7-12 ×; in *B. septiceps* there are rather decided indications under somewhat stronger powers.

Nativities of the five Brassicas treated in this paper are unknown. The same is true of several of the accepted species of Linnæus and other early authors. These plants have been in cultivation for untold years, and undoubtedly have passed from hand to hand in many countries without note or record. They may have been botanically described in the long course of their history although I cannot discover positive names for them; and the presumption is rather against it inasmuch as plants of long domestication are taken for granted and nobody fathers them. Whatever may be the nomenclature behind them, it is no gain to put them into species to which they do not belong. I do not know any accepted species of Brassica to which these plants can be referred without so extending the definitions of those species as to break them down.

To propose a new nomenclature for some of the Brassicas now under consideration involves risk of duplication of very old names. These early names are so poorly defined, however, that one uses them without conviction; naturally, botanical characters we now employ to distinguish them were not then recognized. The *Brassica oleracea sabellica* of Linnæus, 1753, is a case in point; the name came up from the herbalists, and probably had reference to a plant used by the Sabellians, a mountain people back of Rome. Plenck in 1794 (Icones Plantarum Medicinalium) presents a colored plate of *sabellica*, and it



202. SEEDS OF TENDERGREEN.—*Brassica perviridis* (×15).

suggests a form of the flowering stage of a kitchen kale, a plant I now separate (*fimbriata*) as if it were a distinct species. There is no indication, however, that this plant is the *sabellica* of Linnæus, who left no specimen of it named in his own hand. In fact, Linnæus based the variety on reference to Kaspar Bauhin 1623, and to Reneaulme 1511. There is nothing in Bauhin to identify the plant, and the picture in Reneaulme is Savoy cabbage. The name *sabellica* appears not to have been raised to specific rank unless in Persoon, 1805, and then only in synonymy as a horticultural unit, and under the Rules a synonym does not hold in nomenclature. It is cited as if a specific name by DeCandolle in Transactions of the Horticultural Society of London in 1824, p. 10, but his reference is only to a varietal usage. The name appears in various writings and under different interpretations as a variety of *B. oleracea*. Even if we can identify the plant by search in the herbals, that fact would not affect the current nomenclature.

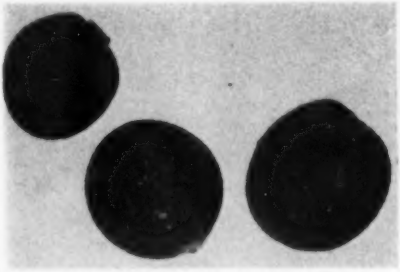
Similar history may be given for *B. oleracea selenisia*, Linn., and it need not be followed in this connection.

The earliest clear botanical naming of kitchen kale I know is by the encyclopedic Philip Miller in 1768 (Gardener's Dictionary) where it is *Brassica oleracea* var. *fimbriata*, a very good name for the plant, following the practice of earlier time.

SET I. SEED-COATS FEATURELESS, SEEDS LARGE: full grown seeds in any authentic sample 2-3 mm. long, rounded, not tapering to either end or cornered, raphal creases prominent (if at all) usually only in smaller and probably not fully developed examples (but sometimes the radicle-ridge is conspicuous independent of the grooves). Fig. 200.

Here belong the true coles with heavy thick glaucous-blue foliage, big broad rounded radical leaves not deeply laciniate or fimbriate, with expanded ambitus or peripheral outline, extended inflorescence, large light yellow to ochroleucous flowers, lengthened long-beaked thick pods: *B. oleracea* and associates, not under discussion in this paper, wild plant on the coasts of western Europe, tree kales, broccoli, brussels sprouts, cabbage, cauliflower; *B. caulorapa*, kohlrabi; *B. alboglabra*, Chinese kale; *B. Napus*, rape and oil rape; *B. Napobrassica*, rutabaga.

SET II. SEED-COATS FEATURELESS, SEEDS SMALL: mature seeds mostly less than 2 mm. long, usually angled or cornered in outline, raphal lines likely to be prominent.



203. THE SMALL SEEDS OF *Brassica Ruvo* (×15).

The Rapa-Campestris group, lacking very heavy and fleshy strikingly glaucous-blue foliage or greatly expanded leaves: plants mostly green, sometimes thinly glaucous: leaves oblong or oval or with elongated ambitus, often deeply side-lobed and curled: flowers short or long, sulfur-yellow to nearly ochroleucous, clusters sometimes very short. Figs. 201, 202, 203.

Only five cultigens are involved in the present study. Others are *B. campestris, Rapa, nipposinica, pekinensis, narinosa, chinensis, parachinensis, dubiosa, napiformis:* key to these and others may be found in Gent. Herb. ii, 220, 221.

SET III. SEED-COATS CONSPICUOUSLY FOVEATE or pitted under a good lens: seeds medium to large. No. 4 in Fig. 108, fasc. v, Gent. Herb. ii (1930).

The Juncea group, extensively grown mustards and "greens," not under discussion in this paper.

The new Brassicas in Set II

A. Flowers very large at optimum seasonal bloom, about 2 cm. or more across at full expansion: blooming cluster elongated and open: pod 6-7 cm. long at maturity, with very long beak.
  B. Leaves, both radical and cauline, deeply lobed and cut, often curled, those on the stem with very long teeth or prongs.....1. *B. fimbriata*
  BB. Leaves of both kinds not lobed or cut, although sometimes obscurely dentate or crenate.....2. *B. perviridis*
AA. Flowers usually less than 2 cm. across, often only 1 cm.: blooming cluster short and mostly compact, perhaps elongating somewhat in fruit: pod 4-5 cm. or less.
  B. Cauline leaves broad-based and auriculate: plant essentially or nearly green: main stems several from a single crown: radical leaves distinctly lyrate, terminal lobe not greatly expanded: biennial.....3. *B. septiceps*
  BB. Cauline leaves narrowed to base and lower ones if clasping then only by expansion of the petiole-like part: main stems 1 or 2 from one crown: radical leaves with side lobes beneath a much expanded rounded terminal part: annual or biennial.
    C. Plant green: lower cauline blades lacking a very slender petiole-like part.....4. *B. Ruvo*
    CC. Plant purple tinged: lower cauline leaves contracted into a wingless and nearly or quite lobeless petiole.....5. *B. purpuraria*

Horticulturally these five species fall into two groups: (1) The dull green, glaucous, or purple hard or thick kales, *B. fimbriata, B. septiceps, B. purpuraria.* (2) The bright green soft or thin kales, *B. perviridis, B. Ruvo.*

1. **Brassica fimbriata,** DC. in Trans. Hort. Soc. Lond. v, 10 (1824). COMMON KITCHEN KALE. DWARF SIBERIAN and SCOTCH KALE. Figs. 199, 201, 204, 205, 206.

B. oleracea var. *fimbriata,* Mill. Gard. Dict. Ed. 8 (1768).

B. oleracea sibirica, Alef. Landwirt. Fl. 236 (1866).

Planta biennis, glabra, compacta, interdum alta, cum rosella foliorum profunde dissectorum, crispatorum, carnosorum, et glaucorum, interdum purpurellorum vel brunneolorum: folia jucundissima spiculifera; folia caulina angusta (non orbiculata), lyrata vel dentata, inferiora petiolata, superiora amplexicaulia et profunde dentata: inflorescentia non densa,

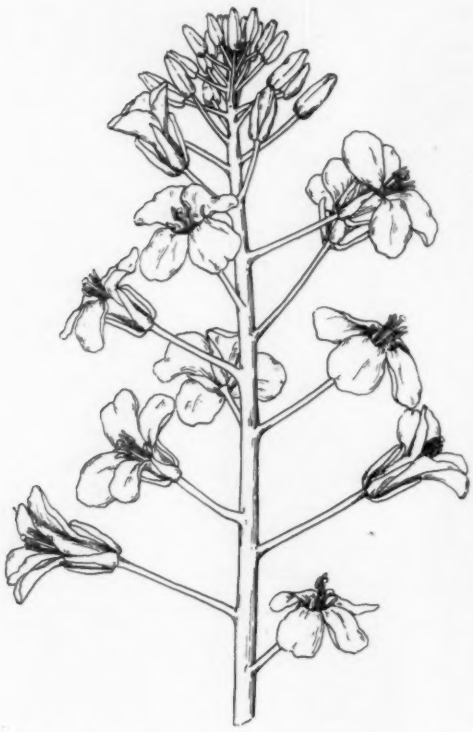
pedicelli tenues; flores fere 2 cm. longi et lati, lutei; sepala angustata, appressa ad corollam: siliquæ 5-7 cm. longæ, divaricatæ; rostrum 1.5 cm. longum; semina 2 mm. vel minus diam., angulata.

Very hardy biennial kale, the much cut and curled thick glaucous foliage bluish-green or strongly tinted purple or brownish, stock short thick and hard in varieties grown in the United States but taller forms known, root not tuberous but composed of many branches and fibers: radical leaves a dozen or more in a clump the first autumn, 12-16 inches long of which about one-third is bare petiole, deeply cut and curled and overlap-lobed, blade oblong in outline, 2 or more pairs of pinnæ on upper part of petiole, seedling leaves bearing a few translucent spicules but mature foliage devoid of them: flowering stems the second year 24-30 inches high, glabrous and glaucous, diffusely branched; cauline leaves many, narrow, lyrate-pinnatifid or the upper ones

204. Flowering system of dwarf Siberian kale.—*Brassica fimbriata*. Note the open racemes and deeply cut stem-leaves.

toothed, 5-7 inches long, lower ones with a slender indefinite petiole-like part which is more or less expanded at base, upper ones with an auricled or clasping base: inflorescence open and axis continuous, 3-6 inches long but perhaps lengthening in fruit; flowers ½-¾ inch long and of similar width at expansion, sulfur-yellow, sepals narrow and loosely appressed and about equalling claws of petals, pedicels slender and usually longer than corolla: pods wide-spreading at maturity on pedicels ½-¾ inch long, body of pod 2-3 inches long with seed placements showing beak about ½ inch long; seed brown-black, 1.5 mm. long or a trifle more, moderately cornered, radicle mark prominent.

Cultivated kitchen kale, harvested in winter and spring, eaten as a potherb; some of the finely cut and curled or crispate leaf forms are highly decorative. To this species belong the Siberian and Scotch kales. The tall or tree kales may be called *B. oleracea* var. *acephala* at least for the present, such as Cow cabbage of the Channel Islands, the only ones often seen in the United States being true Georgia collards (some of the stock sold as collards is said to be young rutabaga herbage).



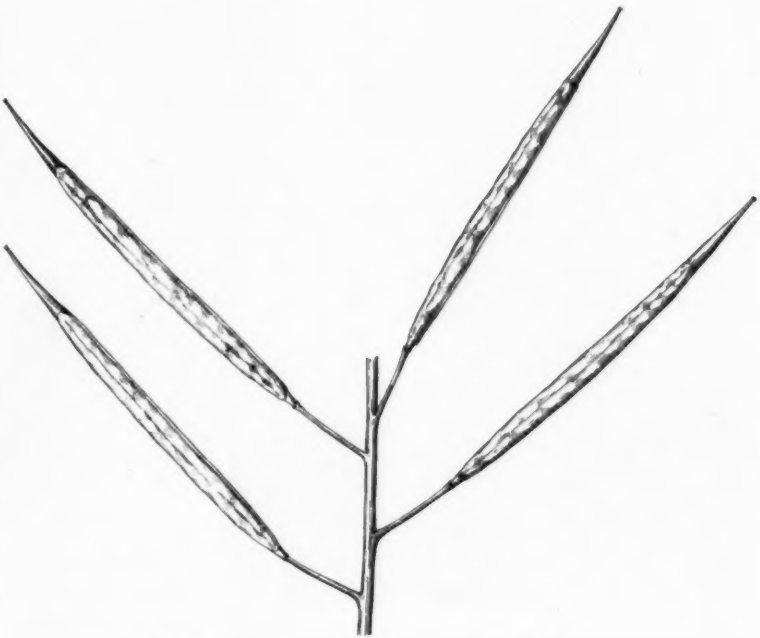
205. THE OPEN CLUSTER AND LARGE FLOWERS of dwarf Siberian kale.—*Brassica fimbriata* (× about 1).

My diagnosis of *B. fimbriata* is drawn particularly from United States Department of Agriculture no. 224222 (Herb. Bailey); also from no. 763925 and P119 and other material from former years in my herbarium.

Title to this species is none too clear. The name *fimbriata* belongs to our plant from the days of the herbalists. Other names are obtruded into the group to which the kitchen kales belong but with less definiteness and more variance. It is necessary to base the species on as early a binomial as possible in order to eliminate some of the modern outlying names, as of

Léveillé or some other, that have no central connection with the case. De Candolle's use of *fimbriata* does not have botanical exactness, and I therefore present Latin and English diagnosis.

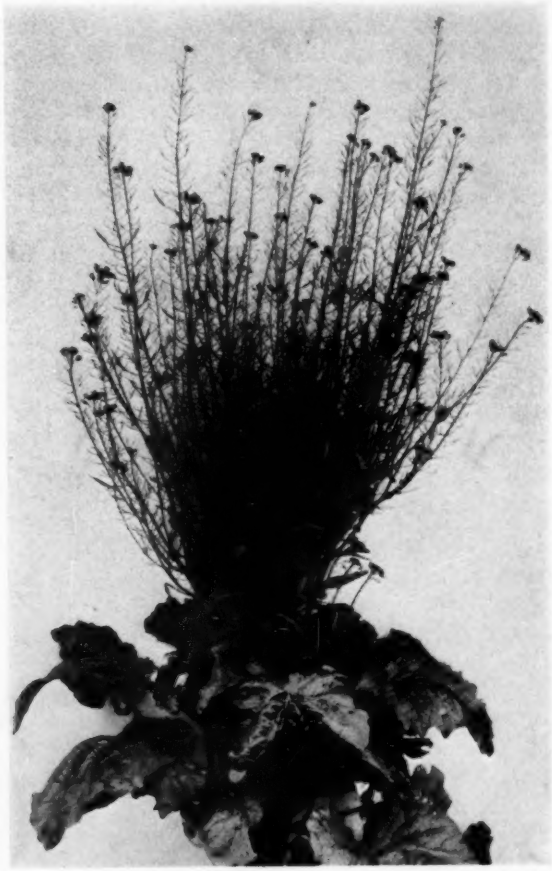
It is noteworthy that DeCandolle typifies var. *acephala* in the Cavalier, which is one of the tree kales or borecoles; it "is distinguished by its lengthened stalk and its scattered and expanded leaves, which do not grow to a head." I have grown *Chou cavalier* (*Chou à vache*, cow kale) and consider it to be *Brassica oleracea* var. *acephala*, although the seeds run through a wide range of sizes probably due to lack of selection. (The French word *chou* signifies any and all of the *oleracea* tribes). Other tree kales I have grown and consider to be var. *acephala* are Jersey Winter, Marrow, Palmier, Flandre, Poiteau, Sarthe, although there are botanical differences that deserve study. DeCandolle recognized other and different kinds of kales, which he called "principal varieties," among which are the kitchen kales here separated (at his suggestion) as *Brassica fimbriata*. One would expect the limits of such cultigens as *B. fimbriata* not to be as definite, after centuries of cultivation, as one hopes to find in indigens of local floras.



206. RIPE PODS OF *Brassica fimbriata*. Natural size.

†2. **Brassica perviridis,** stat. nov. TENDERGREEN. Fig. 202.
B. Rapa var. *perviridis*, Bailey, Gent. Herb. ii, 243 fig. 127 (1930).

A very distinct looking plant with thinnish entire or only crenate-dentate radical leaves, to 4½ feet tall when in flower, green but lightly glaucous when in blooming stage, bearing large thick pods. It sometimes produces tuberous roots. Probably a development from one of the oriental species of Brassica. Species based primarily on plants grown at Ithaca in 1930, seeds from the Van Antwerp Seed Company; FPI numbers 80582, 80934, from Japan are apparently this species.



207. FLOWERING SYSTEM of *Brassica Ruvo*. Note the brush-like top.

†3. **Brassica septiceps,** stat. nov. SEVEN-TOP TURNIP.
B. Rapa var. *septiceps*, Bailey, l.c. 241 fig. 126.

Plant of long and widespread cultivation, spontaneous in middle latitudes in the eastern United States. In describing it as a variety in 1930 I expressed myself in doubt whether to name it a variety of *B. Rapa* or an

independent species. I have grown it over many years. Its kinship is apparently with the flat turnip, *B. Rapa*. It probably should be regularly entered in the manuals of eastern American adventive plants.

†4. **Brassica Ruvo,** cultg. nov. Figs. 203, 207, 208, 209, 210.

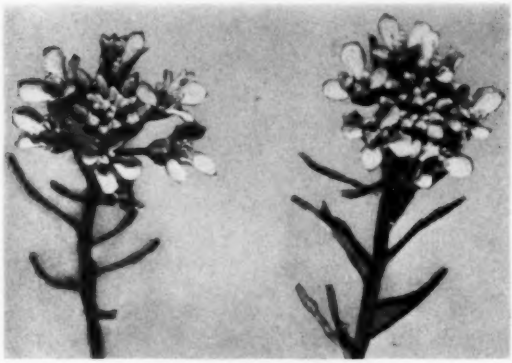
Rapa Ruvo, Hort.

Planta annua v. biennis, precie florens, ad 1 m. alta: folia sæpissime basalia, glabra, viridia, nec glauca nec carnosa; laminæ lyratæ cum expansa, fere tota vel breviter lobata parte terminali; superiora folia caulina angustata, amplexicaulia, attenuata: rami florentes multi tenues; flores 8-10 mm. diam., lutei, denso capite: siliquæ ascendentes, 3-6 cm. longæ; semina minima, atra.

Annual as grown at Ithaca, seeds sown in May producing plants in full fruit in late July and dead in October, making a hard woody stout taproot without large side branches, larger plants standing 3½ feet high: foliage often shiny green not succulent or glaucous, mostly basal, glabrous throughout, seedling plants without spicules; lower leaves to 18 inches long and 8 broad across the large

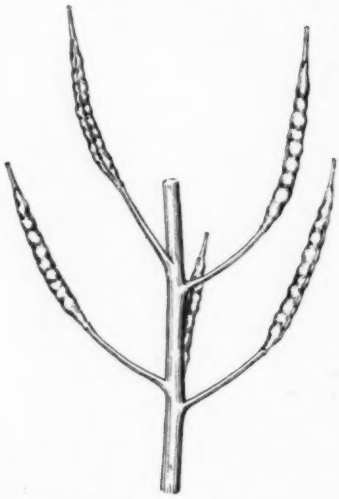
208. Basal leaf of *Brassica Ruvo*. Less than one-half natural size.

rounded expanded end, bearing much smaller lobes or leaflets on the petiole, margins dentate to undulate to practically entire; lowermost cauline leaves broad, imperfectly lyrate and narrowed to a petiole, much like the radical foliage, but true or upper caulines very narrow from the clasping base and margins entire: flowering system relatively short and closely associated with the lower expanded foliage (Fig. 207), comprised of many slender erect branches to make often a broom-like top: flowers light yellow, small, ¼ to less than ½ inch across, compacted in a close umbel-like head that opens up or elongates only in fruit, calyx nearly equalling corolla: pod ascending or curved upward, small, 1½-2½ inches long, beak slender even when short, seeds showing rather prominently; seeds very small, dark brown, not prominently angled.



209. Flowers of *Brassica Ruvo* (×1).

Grown at Ithaca, New York, from seeds supplied by Division of Seed Investigations, United States Department of Agriculture, imported from Holland, numbers 223274 (type, Herb. Bailey) and 224220, called Broccoli and Italian Turnip Broccoli or Rapa Ruvo. The plant tends to run soon to seed, flower-buds sometimes appearing with the first few leaves when started in early season; apparently biennial when sown in autumn and shoots cut in spring. Not to be confounded with Italian broccoli, *Brassica oleracea* var. *italica*.



210. Mature pods of *Brassica Ruvo* (×¾).

† 2. **Brassica purpuraria,** stat. nov.
B. campestris var. (?) *purpuraria*, Bailey, Gent. Herb. ii, 248 fig. 131 (1930).

Potherb plant from China, apparently not yet much known in the United States. I have seen it in China and have received it from there, and have grown it as numbers 63171 (type) and 63162 United States Department of Agriculture; Specimens in Herb. Bailey.

ARTICLE 27. NOVEL CHRYSANTHEMUM SPECIES.

Recently there has come into cultivation in the United States an attractive pink-flowered autumn-blooming perennial under the name *Chrysoboltonia pulcherrima*. Its exact origin appears not to be recorded in botanical literature, and there is no recognized genus Chrysoboltonia. It has been introduced to us, apparently, from continental Europe.

The catalogue or preis-verzeichnis of Georg Arends, Wuppertal-Ronsdorf, Germany, for autumn 1936 and spring 1937, lists the plant with the statement that it is a hybrid between *Chrysanthemum Zawadskii* and *Boltonia latisquama:* "Interessante Hybride von Chrysanthemum Zawadski und Boltonia latisquama. Die straffen, windfesten Büsche sind im Herbst überdeckt mit mittel-grossen, rosa-farbenen Margaretenblumen." At about the same time it was listed elsewhere in Germany.

In 1939 I bloomed Chrysoboltonia from roots obtained of two American dealers. The general character of the bloom is shown in Fig. 211. This plant is clearly a Chrysanthemum; this statement means that both the history and the botany of the plant are likely to be confused, and so it turns out. The plant is a species different from *Chrysanthemum morifolium*, the florist and commercial chrysanthemum, but its identity is involved in the development of that cultigen.

Origin and species of the common florist chrysanthemum have long been subjects of speculation. Once I made an effort to search for the native form of it in China, but came to the "conviction that we should not speculate further on this subject until the wild forms in China are well collected, over a wide range, and are assembled for study": Gent. Herb. i, 48 (1920).

Such a study was made by the late Otto Stapf of the Royal Botanic Gardens, Kew, England, and published in the issue of Botanical Magazine for October 2nd, 1933. He came to the conclusion that the common horticultural chrysanthemum, *C. morifolium* (*C. hortorum*), is a multiplex rather than a straight development from a single species. He speaks of "the original mistaken conception of this garden-species as a group equivalent to the natural species of the field, whereas it is actually an aggregation of forms, accrued as the result of skillful selection from and interbreeding of several species carried on in Chinese and Japanese gardens through many hundred years." In the study of the case, with much horticultural and botanical material before him and full literature, Dr. Stapf described one new species of chrysanthemum, *C. Makinoi*, from Japan, and raised two old botanical varieties to specific rank as *C. erubescens* and *C. vestitum*. He includes three other species, *C. indicum*, *C. ornatum*, *C. japonense*. He thinks *C. Makinoi*,

of which he has a colored plate, "does not seem to have had any pronounced share in the evolution of our garden chrysanthemums." The other five species may have contributed to the making of our present cultigen, *C. morifolium*.

The species longest known is *Chrysanthemum indicum*, founded by Linnæus in 1753, "habitat in India," but geographical references were not exact or in present-day terms at that time. It was many years before the plant intended by Linnæus was understood. Thus, in 1796 and 1819 the plant figured in Botanical Magazine (tt. 327, 2042) under that name is *C. morifolium*, which was separated by Ramatuelle in 1792 to cover the cultivated chrysanthemums then coming into cultivation in Europe and for which in 1914 I proposed the larger class name *C. hortorum*; it is the race to which the binomial *C. sinense* has also been applied.

The *indicum* supposed to have been intended by Linnæus is characteristically figured in Botanical Magazine in 1903, t. 7874, where it is discussed by J. D. Hooker. The long synonymy cited by him suggests a very variable plant. I have seen the plant abundantly on mountains in central China and for many years I have grown it at Ithaca, New York, where it is perfectly hardy. Plants were raised by me first from seeds taken in the wild in China, and they depart widely in leaf characters from the native parent but they

211. INTERSTING HARDY PINK CHRYSANTHEMUM, one-half natural size.—*Chrysanthemum rubellum*.

retain the habit of producing many small heads (1 inch or less across) on short peduncles so that they appear to be almost clustered; rays are close together and yellow. It is a diffuse soft plant, without the straight upstanding habit of the Morifoliums. There is little in the looks of this plant to suggest the florist chrysanthemum.

Chrysanthemum erubescens, Stapf, is the *Pyrethrum sinense* var. *sinense* of Maximowicz, *C. morifolium* var. *gracile* of Hemsley, and *C. indicum* var. *leucanthum* of Nakai. It is a pink-flowered species of northern China, Mongolia and Manchuria, with slender stems, thickish small 3-7-lobed leaves that are nearly or quite glabrous; flower-heads more than 1 inch across, borne more or less singly on rather long peduncles, rays pink. The plant of it I have from the hill country of northern China looks quite distinct.

Chrysanthemum vestitum, Stapf, is known as a native only from a limited area near Ichang, far up the Yangtse in central China; it is a rather thick-leaved species, the blades shallowly lobed to only coarsely toothed or even entire and densely tomentose underneath, flower-heads with white or blush rays and about 1 inch across. This plant was considered by Hemsley to be the original or genuine form of *C. morifolium*, which (as I have said) is the collective name for the florist or garden chrysanthemum.

Chrysanthemum ornatum, Hemsley, is native on the Kiusiu and Shikoku islands, southern Japan. The species was founded by W. B. Hemsley in 1904, distinguished by him when interested in the plants "concerned in the varieties resulting from over a thousand years' cultivation in China and Japan." It is a slender branching herb 3 or 4 feet tall, with white-felted herbage, blades palmately pinnatifid, flower-heads 2 inches across with white rays. It had been cultivated at Kew.

Chrysanthemum japonense, Nakai, is native also on the Japanese islands Kiusiu and Shikoku, apparently little known. It differs from *C. ornatum* particularly in the truncate or cordate base of the leaf-blades, and Stapf remarks that the leaves are "the closest approach to the leaves of the garden form" known as *C. morifolium*. Makino, the Japanese botanist, apparently considers it to be the spontaneous form of the florist chrysanthemum.

What was once considered to be *Chrysanthemum erubescens* received much attention on exhibition in England in 1935, but the following year J. R. Sealy of Kew declared in Gardeners' Chronicle that the plant was not that species. In Journal of the Royal Horticultural Society for June 1938, Sealy again publishes on the subject and concludes that the plant recently cultivated as *C. erubescens* is really an undescribed species, origin unknown, which he names *C. rubellum*. To this species the plants I have grown as *Chrysoboltonia pulcherrima* and Chrysanthemum Clara Curtis apparently belong. The plant grown with us as *C. coreanum* is very like *C. rubellum* but the flowers are white and fade to pink; the name *coreanum* starts with Nakai in 1922 as a *nomen nudum*.

To the species enumerated by Stapf "and which, in his opinion, may have been used in the evolution and development" of the chrysanthemum of gardens, Sealy adds not only his own *C. rubellum* but also *C. Zawadskii*, Herbich, 1831, of central Europe, in which is included the plant long known as *C. sibiricum*.

All these studies illustrate how complex are the problems associated with the identification of plants long in cultivation as well as how recent are the attempts to elucidate them by careful scientific investigation.

Whatever may be the complexities of identification and nomenclature, it is evident that we have now the beginnings of a new horticultural class of hardy chrysanthemums, quite distinct from the old hardy "Artemisias" (often single-flowered) of gardens which are forms of *C. morifolium*. The *morifolium* chrysanthemums are distinguished by stiffish stout growth, broad thick or heavy large dull colored leaves that are broad at base of blade, pubescent to tomentose (*morifolium* means Morus-leaved or mulberry-leaved); heads commonly large, many-rayed, under cultivation developed into odd, huge, and grotesque forms, involucre scales obtuse and thin-edged; plant with strong characteristic odor and flowers not fragrant; colors now many but not in the true cyanic series.

The *rubellum* chrysanthemums are much more slender even though reaching 2-3 feet in height, foliage light colored and finely cut with the lobes widely separated, blades not large or broad-based, bright green on upper surface and thinly pubescent underneath: flower-heads not long-stalked, 2-3 inches across, fragrant, the narrow rays pink or rose; involucral bracts narrower. It is a graceful attractive plant of much promise for borders and autumn mass effects. The name now begins to appear in print in North America.

A very slender plant of narrow growth is *C. Zawadskii*, which is sparingly listed in this country. I have a sheet of it as cultivated in England in 1925. The leaves are small and deeply lobed into parts ¼ inch or less broad at apex where they are sometimes 3-toothed, passing into almost linear bracts toward the flower-head, which is about 1½ inches broad with pink rays. A good sheet of it from the one place where it is known wild, Mt. Pieninck on the confines (as the label states, 1910) of Hungary and Galicia, is like the cultivated plant; stems 1 foot tall more or less, sparingly branched, from a stout horizontal single main root, leafy from bottom to top, blades on stem 1-1½ inches long but less broad.

I do not know that the true *C. erubescens* is in cultivation in the United States. A specimen under this name grown in New Jersey appears not to be this species and is probably *C. rubellum*. Leaf-blades of the true *erubescens* are lobed only one-third to one-half depth of the blade and sinuses are very narrow. Now that attention has been called to this class of chrysanthemums

growers may be on the lookout for other forms and be interested in identification.

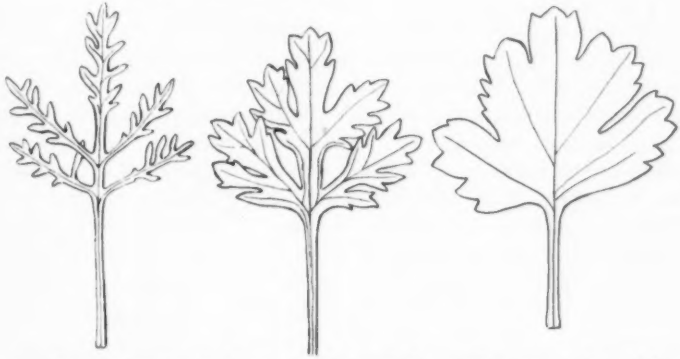
Standing of the three species most directly concerned in this discussion may be stated as follows (from authentic sources):

1. **Chrysanthemum Zawadskii,** Herbich, in Addit. Fl. Galicica, 43 with fig. (1831). Fig. 212.
   Leucanthemum sibiricum var. *acutilobum*, DC. Prodr. vi, 46 (1837).
   Chrysanthemum Zawadskii var. *acutilobum*, Sealy, in Journ. Roy. Hort. Soc. Lond. lxiii, 289 (1938).

2. **C. Zawadskii** var. **sibiricum,** Sealy, l. c.
   Leucanthemum sibiricum, DC. l. c.
   Chrysanthemum sibiricum, Forbes & Hemsl., in Journ. Linn. Soc. Bot. xxii, 438 (1888).
   Leaves larger and less deeply dissected than in the species itself.

3. **Chrysanthemum rubellum,** Sealy, l. c. Figs. 211, 212.
   Chrysanthemum erubescens, Hort. not Stapf.

4. **Chrysanthemum erubescens,** Stapf, in Bot. Mag. sub. t. 9330 (1933). Fig. 212.
   Pyrethrum sinense var. *sinense*, Maxim. in Bull. Acad. Sci. Petersb. xvii, 425, and Mel. Biol. viii, 517 (1872).
   Chrysanthemum morifolium var. *gracile*, Hemsl., in Gard. Chron. ser. 3, vi, 586, 652 (1889).
   Chrysanthemum indicum var. *leucanthum*, Nakai, in Bot. Mag. Tokyo, xlii, 459 (1928).



212. LEAF CONTRASTS in three pink-flowered chrysanthemums. Left to right: *Chrysanthemum Zawadskii, C. rubellum, C. erubescens.* Adapted from Sealy.

ARTICLE 28. PHASEOLUS LUNATUS AND RELATIVES.

In 1923 I made an attempt (Gent. Herb. i, 122) to bring the lima beans into systematic order for purposes of discussion and for record in current literature. I kept the Lima and Sieva beans under separate specific names; and I decided that Linnæus meant to designate the Sieva in his *Phaseolus lunatus*, a conclusion at variance with much former practice. The species names I then retained are *P. lunatus* for the Sievas and *P. limensis* for the big Limas.

The decisions challenged the attention of the late G. P. Van Eseltine of the New York State Agricultural Experiment Station at Geneva, and he published the results of careful studies by himself in Technical Bulletin 182 in 1931, and briefer conclusions in Beans of New York (vol. i, part ii of Vegetables of New York), dated the same year. He concluded that *Phaseolus lunatus*, Linn., is the Sieva bean but united Sieva and Lima within it. Van Eseltine and I had discussed the work at the time, and I am glad of his full historical survey.

It seemed still to be important to test the case again in the field, and in 1933 I grew varieties and races of Limas and Sievas and made detailed comparisons. Drawings and engravings were made, and notes were filed. Now, six years later, I review the findings in brief and test the standing of the nomenclature.

I speak particularly of nomenclature inasmuch as it is yet impossible to determine what are the specific lines in nature. The systematic question must be worked out with abundant native plants, and such material is not assembled. The problem now is with the cultigens.

In my publication I had made Latin-named varieties of certain horticultural races: *P. lunatus* vars. *lunonanus* and *salicis*, *P. limensis* var. *limenanus*. Van Eseltine designated these three varieties as formæ and added two others. These differing treatments are of slight importance inasmuch as they mean only what the particular author defines them to mean. The acceptance of formæ implies in many cases a quadrinomial nomenclature, which I dislike to accept in cultivated plants inasmuch as variations are likely to be so numerous and of so many ranks that categorical definition is impossible.

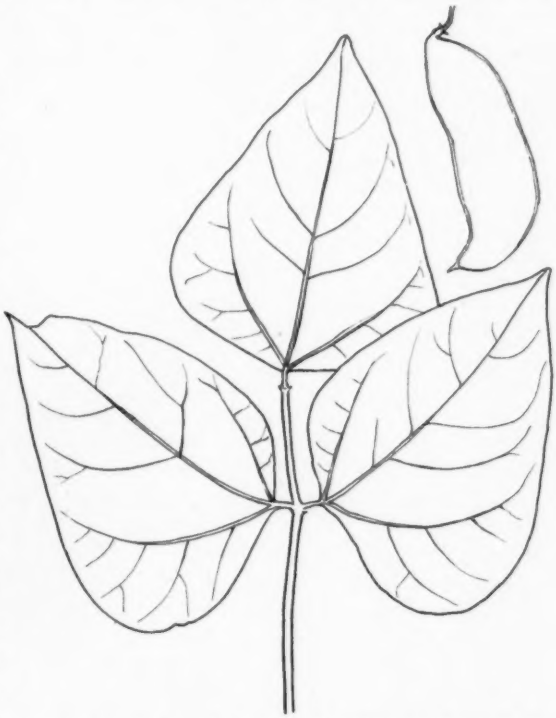
The Lima bean group is difficult in nomenclature both because of the complicated history and variation of the plants under domestication, and final conclusions are not to be expected. In view of these facts I do not cite what ordinarily would be regarded as complete synonymies. Validity of

some of the early binomials is in doubt. For example, we really do not know what Linnæus had in hand for his *P. inamœnus*. What Jacquin thought to be *P. inamœnus* of Linnæus is a form of Willow-leaf Sieva (*P. lunatus* var. *salicis*): Hortus Botanicus Vindobonensis, t. 66 (1770). Bentham in making *P. lunatus* var. *macrocarpus* cites *inamœnus* as a synonym (Fl. Bras. xv, pt. i, 181), and does not mention *P. macrocarpus* of Moench, 1794, although Moench cites *inamœnus*, Linn. as a synonym. If the big Lima bean is rated as specifically distinct from *P. lunatus*, then *P. limensis* of Macfadyen (1837) appears to be the safest name to stand for it.

We are under no obligation to continue names whose application is unknown or not clear, nor is there any requirement to bring up such old names into synonymy. It is difficult to determine what may or may not have been in cultivation in various countries more than a century ago. On the other hand, the binomial *Phaseolus limensis* was made purposely for the tumid Lima bean; James Macfadyen, its author, states in his Flora of Jamaica, "I cannot reconcile the character of this plant with the description of any species hitherto noticed. This is the more remarkable, as it has been long esteemed and in cultivation in the West Indies."

Macfadyen described other new species of Phaseolus. The only one of them represented by herbarium material at Kew is *P. saccharatus:* this is a form of *P. lunatus*.

Further technical studies have convinced me that these two horticultural entities, Lima and Sieva, are now entitled to species rank for purposes of diag-



213. SIEVA BEAN, *Phaseolus lunatus;* about two-thirds natural size.

nosis, whatever may have been the origin of them in nature. They are as distinct in botanical characters as are many other accepted species of Phaseolus. My arrangement now works out as follows:

Phaseolus lunatus, Linn. Sp. Pl. 724 (1753). SIEVA, CIVET, SEWEE BEAN. SMALL LIMA. Figs. 213, 215, 216.

P. lunatus var. *lunonanus*, Bailey, Gent. Herb. i, 123 (1923). *Dwarf Sieva.*

P. lunatus forma *lunonanus*, Van Es. in Tech. Bull. 182, N. Y. Agr. Exp. Sta. 22 (1931).

P. lunatus var. *salicis*, Bailey, l. c. *Willow-leaf Sieva.*

P. lunatus forma *salicis*, Van Es., l. c.

Phaseolus limensis, Macf. in Fl. Jamaica, i, 279 (1837). LIMA BEAN. Figs. 214, 215, 216.

?*P. lunatus* var. *macrocarpus*, Benth. in Fl. Bras. xv, pt. i, 181 (1859).

P. lunatus forma *macrocarpus*, Van Es., l. c.

P. limensis var. *limenanus*, Bailey, l. c. 125. *Dwarf Lima.*

P. lunatus forma *limenanus*, Van Es., l. c.

P. lunatus forma *solanoides*, Van Es., l. c. *Potato Lima.*

Contrasts in the two species:

P. lunatus. Plant slender, low-climbing, annual, glabrous or only sparingly hirsute-pubescent: leaves thin; leaflets broad-ovate, acute, laterals lop-sided, terminal somewhat triangular and 5-9 cm. long and 6 cm. broad, stipels acute: raceme very slender, flowers mostly contiguous, small, slender-pedicelled, 9-11 mm. long at full expansion, length of wings 6-7 mm. and breadth 4 mm., calyx-bracts oval and nearly or quite equalling calyx and bearing a strong central and usually 2 side nerves: pod 5-9 cm. long and about 16 mm. broad at maturity, curved to scimitar-shaped or lunate, with sharp projecting point, thin and papery in texture and seeds rattly therein when ripe, the dorsal ridge continuous (not wavy), dehiscent at maturity and the drab valves often rolling; seed small and thin, sides not prominently bulged, irregularly and sometimes angularly broad-oblong to ellipsoid or rhomboidal, 10-15 mm. long and two-thirds as broad, white or brown or red or speckled to black, with impressed lines radiating from the hilum; caulicle about 7 mm. long when the seed is soaked.

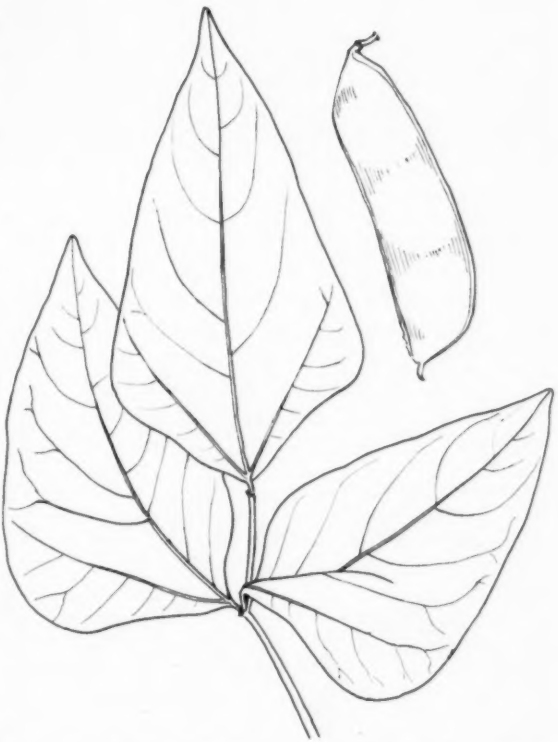
P. limensis. Plant stout, higher climbing, potentially perennial, mostly thinly grayish-pubescent, later-flowering: leaves firm or thick in texture; leaflets long-ovate to lance-ovate, long-tapering but hardly acute, to 10 or 13 cm. long, stipels hardly acute: racemes stout, lower flowers usually remote, large (nearly twice the bulk of those of *P. lunatus*), stout-pedicelled, 14-15 mm. long, length of wings 8-10 mm. and breadth 6-7 mm., calyx-bracts about half or one-third as long as calyx and less evidently nerved: pods 7-13 cm. long and 2.5-3.5 cm. broad at maturity, straightish to curved, with straight or somewhat hooked short beak, thick and firm in texture and seeds held firmly, the dorsal ridge double and broad and usually depressed or scalloped between the seeds, tardily or perhaps not at all de-

hiscent and sometimes rotting on the ground without dehiscence; seed twice or more the bulk of that of *P. lunatus* and mostly less angulate in outline, 18-25 cm. long, thick and often with full or bulging sides, more or less radiately grooved or lined, usually white; caulicle about 11 mm. long when seed is soaked.

The case of Lipusa

In 1866 Dr. Friedrich Alefeld in his interesting Landwirthschaftliche Flora, Berlin, established the genus Lipusa (p. 26), and transferred to it two species theretofore named in Phaseolus: *Lipusa multiflora* and *L. formosa*. This genus appears to have attracted little attention by his successors, being included merely as a synonym of Phaseolus. The genus is characterized by bearing the stigma on the outer side of the style (rather than on the inner side or apex) and by the hypogeal rather than epigeal germination.

In the Scarlet Runner beans named *Lipusa multiflora* by Alefeld and known to us in this day as *Phaseolus coccineus*, Linn., the position of the stigma is easily observed both by opening the keel of the flower and by examining the naked ovary as soon as the petals have fallen: in the coil at end of the keel the expanded disk-like stigma is seen on the outside of the apex on the upward curve of the stiff style. If now the observer opens the coil in the flower of the common bean, *Phaseolus*



214. LARGE LIMA BEAN, *Phaseolus limensis;* about three-fifths natural size. Note the longer leaf shape and different beak to the pod.

vulgaris, he finds a very long slender style with a small scarcely expanded stigma apparently active at the apex and down the side. If then he pries into the little flower of Sieva, *Phaseolus lunatus*, he finds the slender coiled style of *vulgaris* and stigma much as in that species. Similar structure is in the Tepary, *P. acutifolius*. There is decided difference in stylar character as between *P. coccineus* and the three other species. These three species are epigeal in germination (cotyledons elevated above ground).

A structure different from either of the foregoing obtains in the annual Rice bean, *P. calcaratus*, which has hypogeal germination (cotyledons remaining under ground), and a different one still in the Adzuki, *P. angularis*, also hypogeal; moreover, these two stylar morphologies are very unlike that of the hypogeal *coccineus*. That is to say, the stigmatic character does not appear to correlate with the germination character. We can hardly base generic separation on duration of plant (annual or perennial). I am unable, therefore, on these grounds, to maintain the genus Lipusa.

Another character separates the Scarlet Runner tribe, *Phaseolus coccineus:* it is the membranaceous inner lining of the pods that surrounds the seeds and makes parchment-like pockets or compartments for them; but I do not see that this constitutes a generic character.

Horticultural synonymy of the Scarlet Runner or Multiflora group may now be stated:

Phaseolus coccineus, Linn. Sp. Pl. 724 (1753).

P. vulgaris var. *coccineus*, Linn. Sp. Pl. Ed. 2, 1916 (1763).

P. multiflorus, Lam. Encycl. iii, 70 (1789).

Lipusa multiflora, Alef. Landw. Fl. 26 (1866).

P. coccineus var. *albus*, Bailey, Man. Cult. Pl. 396 (1924). *White Multiflora. White Dutch Runner.*

Lipusa multiflora var. *alba*, Alef. l. c.

215. FLOWERS OF PHASEOLUS, about twice natural size. Two at left (top and bottom), Sieva, *P. lunatus*. Two center, Lima, *P. limensis*. One at right, Kentucky Wonder Wax, *P. vulgaris*, for comparison.

P. coccineus var. *albiflorus*, Bailey, Gent. Herb. i, 125 (1923). The citation in Hegi, Illust. Fl. Mitt.-Eur. iv, pt. iii, 1638 (1924) I am unable to verify: "f. albiflorus (Lam.) Wettstein (= Ph. multiflorus Lam. var. albiflorus Lam. und var. albus Mart.)"

P. coccineus var. *albonanus*, Bailey, l. c. *White Dwarf Multiflora.*

P. coccineus var. *rubronanus*, Bailey, l. c. *Red Dwarf Multiflora.*

216. Seeds of Phaseolus, natural size. Upper line across page Sieva beans of two garden varieties (four seeds of each), *P. lunatus*. Lower line, two varieties of Lima beans (three seeds of each), *P. limensis*.

ARTICLE 29. NEGLECTED JASMINUMS.

In California a unifoliolate white-flowered Jasminum, said to be the best of the wall jessamines in the state, has long been planted but remains without identification. (Fig. 217). It is variously called *J. calcarium*, *J. azoricum*, *J. gracillimum*, *J. poeticum*, *J. simplicifolium*, and has been likened to *J. officinale* despite its simple leaf. It is supposed to be native in Australia. It has been stated that the flowers are yellow, but this is an error.

The present article is concerned with the identity of this handsome jasmine. I have sent specimens to one of the institutions in Australia, where it was identified as *J. simplicifolium*. I sent material to the late N. E. Brown, critical botanist at Kew, who compared it with the whole genus in the Kew herbarium and found no match for it, and concluded it may be undescribed. It has also been compared at the Arnold Arboretum, without decision.

I have also been through the large herbaria accessible to me in this country but without result except that once I found a specimen of my plant from a garden in southern France, taken in 1869, but without a name. In my own herbarium is a piece of it from a cool greenhouse in Italy under the name *J. marianum*, DC. (from the Mariana archipelago, Pacific Ocean), but type specimens of that species in the DeCandollean herbarium represent a very different plant.

Obviously, my plant is not *J. azoricum* or *J. gracillimum*. The nomen "poeticum" does not exist in botanical literature, and I suppose the name merely means confusion with the poets jessamine, *J. officinale*. There remains the search for the true *J. calcarium* and *J. simplicifolium*, to which it is most frequently referred and with which it is apparently related. The Unifoliolate section of Jasminum is confused and is much in need of revision.

Ferdinand von Mueller published *Jasminum calcarium* from West Australia in 1858 (Fragmenta i, 212). It is a weak shrub with sometimes scandent branches and terminal, perhaps also lateral, 3-forked loose panicles of milk-white or rarely flesh-colored flowers: calyx-lobes long and very narrow but with obtusish ends that do not equal the corolla-tube: leaves 2 inches or less long, simple, lanceolate to ovate-lanceolate, acute or seldom obtuse, essentially pinnate-veined, petiole very short.

The plant (*J. calcarium*) was collected by Aug. Oldfield on the Murchison River.

From the National Herbarium of Victoria, Australia, I have received pieces of the type material. This material contains two species, to one of which Von Mueller's diagnosis applies, and a drawing constructed from it

is reproduced in Fig. 219. In subsequent lists by others the specific name has been spelled *calcareum*, but *calcarium* is correct Latin (whatever it may be in English) for a plant growing on calcareous hills ("in collibus calcariis"). The name is not a typographical error in the printed account, for Von Mueller writes it with a penultimate *i* on his label.

I have not seen *Jasminum calcarium* in cultivation.

Georg Forster founded the species *Jasminum simplicifolium* from a South Pacific island in 1786 (Florulæ insularum australium Prodromus, 3), the diagnosis being so brief and the habitat so infrequently visited by botanical collectors that the identity of the plant has remained unknown until the present day. Forster bestowed the name *simplicifolium* because he did not know any other simple-leaved Jasminum; and others have substituted other names for his when it became known that many species are unifoliolate (as Persoon's *J. australe* in 1805), thus extending the confusion. Forster's name must hold if its application can be accurately determined.

217. NEW SPECIES OF JASMINUM, three-fourths natural size.—*Jasminum absimile.*

What is considered to be Forster's type is in the herbarium of the British Museum, and by the courtesy of the officials of the Natural History branch of that institution a photograph is before me. This picture (enlarged to about natural size) discloses a plant different from the one we have passed as *simplicifolium*, even from

the historic picture, t. 980, Botanical Magazine 1807. This original plant is unlike anything I have seen in cultivation and from the plant extensively naturalized in Bermuda that goes under the name *simplicifolium*.

The Forster specimens are two, clearly one species, from Tongabatu, one of the Tonga group of islands on the 20th parallel of the South Pacific. The only specimens I have seen that I can refer with more or less confidence to this Jasminum are three sheets in the herbarium of the Arnold Arboretum of Harvard University, no. 1906 Prony, collected in 1914 on New Caledonia, an island in the same general south latitude as the Tongas but much farther east; but leaf shape and venation need to be compared with good specimens from Tongabatu. It is a question whether any of the *simplicifolium* of Australia really belongs to that species.

218. TWO CONFUSED JASMINUMS, natural size. *a a, Jasminum absimile; b b, J. gracile*, improperly called *J. simplicifolium*.

The true *J. simplicifolium* as here reconstituted (and represented in Fig. 220) is a slender viney glabrous plant with relatively few flowers mostly in loose axillary (rather than terminal) long-peduncled panicles: leaves simple, lance-ovate and long-acuminate, base broad or indifferently narrowed, coriaceous, shining above, pinnately veined, prominently petioled with the joint midway or toward the basal end: flowers very fragrant, apparently white, long-pointed in bud, rather small, about ¾ inch long, on slender pedicels, floral bracts at axils minute; calyx about one-fourth length of corolla-tube, parted half its length into very narrow acute spreading lobes; corolla-lobes narrow and acute, about the length of tube.

Having now removed *Jasminum simplicifolium* from our reckoning, we may ask what is the plant passing under that name in cultivation and as introduced and spontaneous. Most of the cultivated material I have seen is apparently *Jasminum gracile*, Andrews (Bot. Rep. t. 127, 1800, and Bot. Reg. t. 606, 1822). (Fig. 218). It is a strong glabrous vine, sometimes bush-like, with flowers in rather small but open terminal peduncled panicles: leaves simple, rather small, mostly about 1½ inches long, ovate with the point either bluntish or apiculate, base more or less rounded or at least not cuneate, glossy above, pinnately veined, petiole short with joint near the basal end: flowers white, fragrant, about ¾ inch long, the 5 or more narrow acute lobes giving a starry effect and about as long as the tube, pedicels nearly or quite as long as the blossom; calyx short, about one-fourth length of corolla-tube, with variable acute lobing but never deeply dentate and teeth often nearly obsolete: berries black, nearly or quite globular, ½ - ⅝ inch diameter.

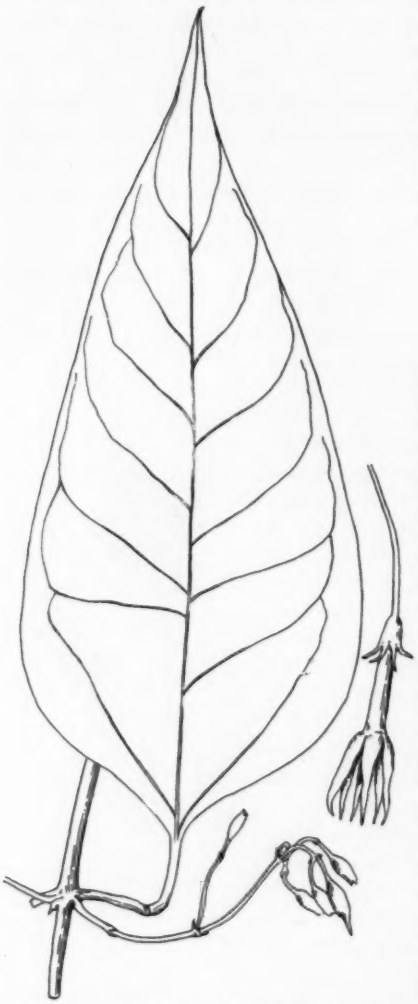
219. Co-type specimen of *Jasminum calcarium*. Natural size.

Australia: New South Wales, Queensland; New Hebrides in the South Pacific; spontaneous in Bermuda; widely planted for ornament.

Another cultivated jessamine sometimes taken for *simplicifolium* is *Jasminum acuminatum*, R. Brown from Australia. Fig. 221 shows the plant as grown at Santa Barbara, California. It is a white-flowered climber with coriaceous simple leaves glossy above, ovate-acuminate, pinnately veined, petiole medium length and jointed near the base, flowers on strongly divaricate branches of a terminal open panicle; bracts minute; pedicels conspic-

uous; calyx about one-third length of corolla-tube, with very short bluntish teeth.

We now return to the purpose of this article, which is the determination of the wall jessamine grown in California. It is not unlikely that the plant has been named and described somewhere in the long history of this large and puzzling genus, but I have not been able to match it satisfactorily with any species in the literature; therefore, for exploratory purposes, I describe it as a new species. Probably it is not a modified cultigen.



220. TYPE SPECIMEN of *Jasminum simplicifolium*, a species not in cultivation. Natural size.

† **Jasminum absimile,** spec. nov. Sect. Unifoliolata. Figs. 217, 218.

Frutex scandens, glabra, non glauca: folia unifoliata, ovato-lanceolata, 4-6 cm. longa, 2-3 cm. lata, obtusa vel minute apiculata, nervi anastomosi, supra nitida, petiolus ca. 1 cm. longus: paniculi multi, axillares et terminales, pedicelli ca. 1 cm. longi; flores albi, ca. 2.5 cm. longi, tubus longior quam obtusi et acuti lobi; calyx quarta tubi corollæ, lobi longi, angusti, acuti, subulati.

Slender woody glabrous very floriferous white-flowered vine with green (not glaucous) foliage: leaves ovate-lanceolate or somewhat broader, 4-6 cm. long and one-half as broad, mostly narrowed to base, apex briefly blunt and sometimes apiculate, midrib prominent, one or two obscure side veins parallel to margin and interlocking veins between, more or less glossy above, petiole about 1 cm. long with joint below the middle: panicles profuse, axillary as well as terminal (whence the floriferousness), more or less leafy and therefore not long-peduncled, bractlets very narrow, pedicels slender, about 1 cm. or less long;

flowers about 2.5 cm. long, corolla-tube considerably exceeding the 6 or 7 narrow lobes most of which are acute and others obtuse on the same plant; calyx one-fourth or less as long as the corolla-tube, lobes well separated and about as long as the cup, 1-3 mm., very narrow and acute.

Probably Australian, but may be South African. Although not glaucous this plant may be allied to *J. glaucum*, Ait. of South Africa, but that species differs in its habit, smaller leaves with different venation, condensed inflorescence and shorter flowers. *J. absimile* is described from plants cultivated in California; type, *Woodcock 630* in Bailey Hortorium. The species is useful in cultivation as a wall, trellis and ornamental hedge plant. A good portrait of it, under the name *J. simplicifolium*, is the frontispiece of National Horticultural Magazine, Washington, January 1938.

All these simple-leaved jessamines belong to the group of open-panicle species, in distinction from those bearing flowers in close clusters or heads. Among themselves they may be keyed as follows:

221. WHITE-FLOWERED CLIMBING JASMINUM, about natural size.—*Jasminum acuminatum.*

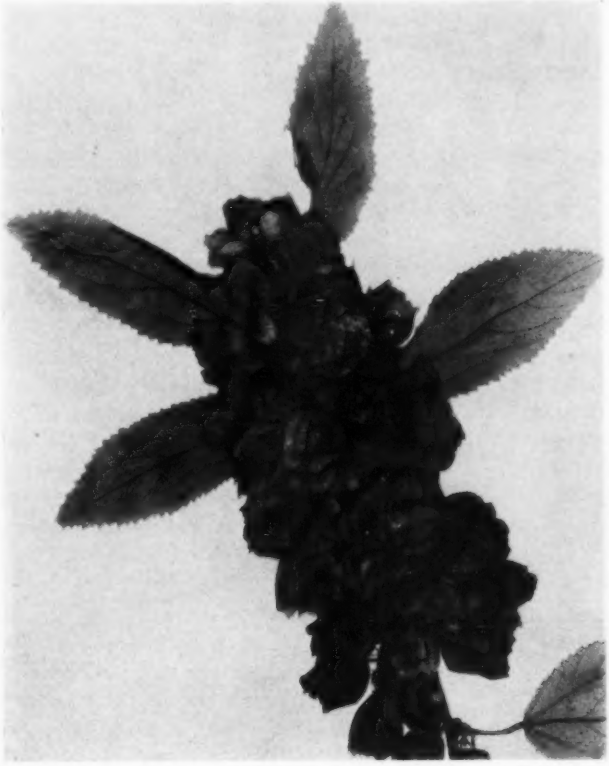
A. Calyx-cup bearing short blunt teeth, sometimes even obscure.
  B. Leaf-blade usually 7-8 cm. or more long, regularly long-acuminate: panicle divaricately branched.....*J. acuminatum*
  BB. Leaf-blade mostly 5 cm. or less long, ovate, point brief and blunt or minutely apiculate: panicle upwardly branched or forked.....*J. gracile*
AA. Calyx-cup bearing narrow or subulate lobes often longer than itself.
  B. Lobes of calyx extending nearly to base of cup: leaf-blade 5 cm. or less long, lanceolate, not long-pointed even if acute: corolla-lobes blunt. .....*J. calcarium*
  BB. Lobes of calyx relatively shorter: leaf-blade broader: corolla-lobes prevailingly acute,
    C. Blade of characteristic leaf 8-10 cm. long, broad toward base, tapering to long sharp point, pinnately veined: panicles mostly axillary, long-peduncled, few-flowered.
      D. Petiole jointed and bent midway: main part of blade oblong to elliptic, then gradually taper-pointed.....*J. simplicifolium*
      DD. Petiole short, not jointed or bent: main part of blade ovate, then abruptly pointed.....*J. marianum*
    CC. Blade of average leaf 5-6 or 7 cm. long, lanceolate, more than twice as long as broad, not broadest toward base, interveined: panicles terminal and axillary, short-peduncled or leafy to the branches, many-flowered.....*J. absimile*

ARTICLE 30. SEGREGATION FROM WALTHERIA.

When collecting along the Orinoco River many years ago I was impressed with dissimilarities between *Waltheria involucrata* and other species of the genus. I have hoped some person would include a study of this species when considering South American plants, but have not met with such discussion and I now express my own opinion.

†**SITELLA,** gen. nov. Sterculiacearum. Figs. 222, 223.

Segregata a Waltheria: flores fere 2 inclusi in profunde, tenui, inflato, monophylloso, dentato involucrali calice fere 1 cm. longo et 1. cm. lato ad

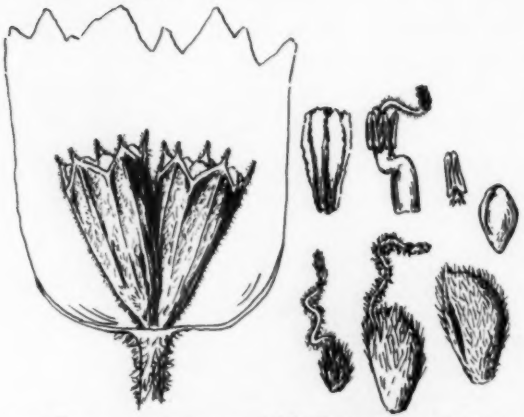


222. THE CROWDED FRUITING CLUSTER of *Sitella involucrata*. Nearly natural size.

medium sed ad apicem angustato; calices pedicellati in compactis, axillaribus paene sessilibus glomerulis, non in pedunculis longis vel ramulis; petala fere paria in longitudine calici, non expansa: capsula loculicidalis hirsutaque; semen glabrum. Arboriformis ramis gracilibus flagelliformibusque.

†**Sitella involucrata,** trans. nov.

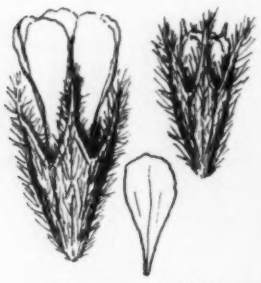
Waltheria involucrata, Benth. in Hooker, Journ. Bot. iv, 125-6 (1842); Schumann, in Martius, Fl. Bras. xii, pt. ii, 52 t. 11 (1886).



223. The cup or involucre of *Sitella involucrata* with two included flowers; also corolla, essential organs, anther, seed, pistil, two fruits. (×4).

Dry lands, a tree-like species with long flexile branches, Venezuela, British Guiana: near Ciudad Bolivar on the Orinoco, *Bailey 1921, no. 1427;* British Guiana, high banks of Rupunoony, *Schomburgk no. 722,* Mt. Roraima and vicinity, *G. H. H. Tate no. 139.*

The particular mark of separation of this plant from Waltheria, aside from its somewhat arboreous character, is the large inflated papery involucral cup (Latin *sitella,* little urn) in which the small oblong flowers are contained, as well as the hop-like glomerules or heads formed by the aggregate pedicellate cups, the glomerules not long-stalked or manifestly peduncled; flowers usually 2 to each cup, only one of which may be strongly developed.



224. Details of *Waltheria americana* (×4). Single flower, showing petals and one not yet opened; separate petal.

Material of my no. 1427 was compared for me in 1930 by the late N. E. Brown with the Bentham type at Kew with the opinion that it is "quite the same in all particulars." Fig. 224 contrasts the floral structure of the familiar *Waltheria americana.*

ARTICLE 31. TWO PSEUDERANTHEMUMS, AND NOTES ON NOMENCLATURE.

Question has arisen on that practice of nomenclature that disregards the publication of species in trade advertisements, and the question involves names I published many years ago in Pseuderanthemum: F. R. Fosberg, American Journal of Botany, April, 1939. p. 230. Inasmuch as I am soon obliged to list the species of Pseuderanthemum in cultivation in North America, it is incumbent on me to review the standing of the names now challenged.

In my study of Eranthemums (Acanthaceæ) in cultivation I found two quite different plants called *E. atropurpureum* and I gave one of them a new name when making transfer to their proper genus, Pseuderanthemum: see Gent. Herb. i, 129-130 (1923). One of the plants was named *Eranthemum atropurpureum* by Bull in 1875 and the other in error by J. D. Hooker in 1902. Hooker's plant I named *Pseuderanthemum kewense*, and retained Bull's trivial name (*atropurpureum*) for the other under Pseuderanthemum.

Fosberg contends that *atropurpureum* of Bull was not technically published inasmuch as it first appears in an advertisement and without sufficient diagnosis, and that Hooker's *atropurpureum* should be retained for his plant, Bull's name for the other plant being dropped and for which a new nomen should be devised. The International Rules carry no declaration against the use of names first appearing in an advertisement, although, of course, botanists do not practice recognition of them unless under exceptional circumstances.

Bull's *atropurpureum* did not appear in a trade catalogue or fugitive publication. It was an account of new Eranthemums inserted as an advertisement in Gardeners' Chronicle on a page containing regular reading-matter and numbered serially as a leaf to be retained when the volume should be bound: Gard. Chron. n. s. iii, 619 (1875). Of course the description is not precise, and the plant had not bloomed, but there is enough in the account to distinguish it from the *atropurpureum* of Hooker and it is a better description than many others we are compelled to accept:

"An erect-growing stove plant, with the stems and leaves wholly of a dark lurid purple colour, which in the young leaves takes a deep sanguinous hue. They are ovate, entire, stalked and opposite, and acquire rather a large size, so that the plant is adapted to take a very prominent position amongst ordinary decorative stove plants, the deep wine-purple colour of the leaves contrasting finely with the ordinary green of most other plants."

Moreover, there is at Kew, as I was then informed, a specimen of Bull's sent by him before its announcement in Gardeners' Chronicle. My information from Kew stated: "From a letter received from Bull and addressed to Oliver in Sept. 1878, it seems certain that a specimen preserved in the Kew Herbarium, 'So. Sea Islands' ex Hort. Bull. xi/72, must be regarded as the type of *Eranthemum atropurpureum* Bull." This information does not tally with Fosberg's statement that the specimen was "deposited at Kew by Bull many years after the publication of the name and by no means necessarily the same plant as that described in 1875."

In studying the case on the occasion of my publication, I had sent to Kew specimens of the cultivated plant I knew as *atropurpureum* and received reply that it "agrees very well with the type of *Eranthemum atropurpureum*, Bull (non Hooker) preserved in the Kew Herbarium, and we accept it as the same species." They sent to me, also, a specimen of the *atropurpureum* of Hooker which was "still under cultivation at Kew"; it was the Hooker *atropurpureum* that I named *kewense* (under Pseuderanthemum). Although the description by Bull was inadequate, the evidence of authentic specimens I thought to be sufficient to verify the use of his name, a procedure of course common in systematic work.

Bull's name *Eranthemum atropurpureum* was accepted as published and tenable by J. D. Hooker in Botanical Magazine (t. 7839) in 1902 and he completed the diagnosis. It turned out, however, that he had something different from that of Bull, and this is the reason for my giving the new name, *kewense*, to his plant; as Hooker's account rests on a misidentification his name should not be accepted. Index Kewensis, 1895, also enters *E. atropurpureum*, Hort., with the Bull citation, as an indexible name. The plant was entered in Bull's Catalogue for 1875, and from that source also it was recorded as a new species, e.g. Just's Botanischer Jahresbericht, 1876, p. 1333, La Belgique Horticole, 1876, p. 151; also L. Radlkofer in 1883 (published 1884) in Sitzungsberichte der Bayr. Koenigl. Akad. der Wissenschaften zu München, xiii, 286, where transfers are made to Pseuderanthemum. This is the plant in general cultivation as *atropurpureum*, and the name should be retained if possible; I do not know *P. kewense* in cultivation outside of Kew.

Fosberg states that inasmuch as Bull's *Eranthemum atropurpureum* is a *nomen subnudum* it has no standing and that transfers made of it are "of course, invalid." However, there is no category of *nomina subnuda* in the International Rules and therefore no pronouncement on the treatment of them, if they exist. Three categories are mentioned in the Rules: *nomina dubia*, when the application is uncertain, and which are disqualified; *nomina ambigua*, employed in different meanings, and for which a list is to be prepared of those to be abandoned; *nomina confusa*, names based on

characters of two or more entirely discordant elements and of which a list is to be provided. The Bull name falls in none of these categories. There are no *nomina nuda* in the Rules, our use of this category being a practical deduction from Article 37; much less is there a class of *nomina subnuda*. Doubtful names outside the three categories and not covered by other regulations are presumably to be adjusted by those given authority officially to interpret the Rules and to assess the consequences.

Again, Fosberg states that *Pseuderanthemum kewense*, Bailey "is, in any event, illegitimate; it was superfluous when published." This interpretation rests on his own assumption that such a publication as Bull's *Eranthemum atropurpureum* is not allowable in nomenclature. I do not here defend the publication or my own use of it but am interested to state the circumstances and to explain that care was taken with the problem at the time. The following year (1924) I published a full description in my Manual of Cultivated Plants, 702, but I should now cite Radlkofer as authority for the binomial *Pseuderanthemum atropurpureum*.

We come now to the important issue of this discussion. Fosberg proposes to amend Article 36 for the purpose of eliminating commercial advertisements as avenues of publication, as follows: "Seedsmen's and nurserymen's catalogs or other obvious commercial advertisements, whether in a periodical or privately distributed, are not to be considered effective means of publication, even though the names used in them are accompanied by descriptions."

I should regret the adoption of this amendment, unless with considerable modification, although sympathetic, of course, with the elimination of usual horticultural forms of binomial publication. Evidence of a commercial transaction is not an essential consideration. It is a question whether existing regulations do not sufficiently safeguard the situation, indicated in the several restrictions on publication, and the requirement of a Latin diagnosis in Article 38.

Such an amendment might not curtail the freedom of taxonomists who work only with wild plants, but distinct hindrances might develop with those who undertake to clarify the systematology of cultivated plants and particularly of cultigens; such persons should be allowed to exercise a certain degree of choice or judgment in many difficult problems when accepted practices of publication are not available in the literature. I do not like the word "commercial" in such proposed amendments because it often would be difficult to define in practice.

Objections to binomial publication in advertising literature are chiefly of four kinds: 1, the probability that the descriptions will not meet the requirements of accurate diagnosis; 2, the fact that the literature is not likely to be of a permanent nature, or kept and catalogued in libraries of standing,

or have bibliographical importance; 3, the danger that the literature may not be accurately dated or capable of establishing personal authority for the name; 4, likelihood that accessible specimens will not be preserved.

In view of all these considerations I retain the Pseuderanthemum names as I published them in 1923, pending, of course, any official determination on the merits of the case. I cannot assume the responsibility to make new names or combinations when the only net result would be additional confusion.